The role of aspirin in the treatment of NAION: Benefits and controversies

BY ALI YAGAN

Non-arteritic anterior ischaemic optic neuropathy (NAION) is the most common acute optic neuropathy in individuals over 50 with estimated prevalence of 2–10 per 100,000 people, characterised by sudden, unilateral vision loss due to ischaemic injury to the optic nerve head. It is widely believed that NAION results from impaired blood flow in the short posterior ciliary arteries that supply the optic nerve, often related to reduction of perfusion (nocturnal hypotension) in patients with underlying vascular risk factors such as hypertension, diabetes, and hyperlipidaemia. Other risk factors include sleep apnoea, use of certain medications such as phosphodiesterase inhibitors (Viagra) and the so-called disc at risk (crowded optic nerves). Given its ischaemic nature, therapeutic interventions have focused on modulating vascular and inflammatory responses, and aspirin has emerged as a candidate due to its well-known antiplatelet properties. However, despite its theoretical benefits, clinical evidence supporting the use of aspirin in NAION is inconclusive, and its widespread use remains controversial.

Benefits of aspirin in NAION

1. ***Antiplatelet***
   Aspirin's primary mechanism as a cyclooxygenase inhibitor leads to reduced platelet aggregation, which can mitigate the risk of thromboembolic events. Non-arteritic anterior ischaemic optic neuropathy is thought to involve microvascular insufficiency rather than thrombotic events but there is a risk of recurrence in the fellow eye which is a significant concern for affected individuals at a rate of up to 20%. The theoretical benefit of aspirin in preventing recurrence is grounded in its ability to reduce clot formation in susceptible vascular beds. Several observational studies have suggested that aspirin may lower the risk of recurrent NAION in the contralateral eye. A notable retrospective study by Salomon, et al. indicated that patients treated with aspirin had a lower rate of NAION recurrence than those who did not receive aspirin [1]. This finding aligns with aspirin's known benefits in preventing ischaemic strokes and myocardial infarctions, where microvascular occlusions are implicated.

2. ***Anti-inflammatory effects***
   In addition to its antiplatelet activity, aspirin possesses anti-inflammatory properties, which could be beneficial in the context of NAION. Inflammation may exacerbate ischaemic damage in the optic nerve head, and aspirin's ability to inhibit the production of pro-inflammatory prostaglandins may help limit this damage. Some hypothesise that aspirin may also offer neuroprotection by mitigating secondary inflammation following the initial ischaemic insult.

3. ***Widespread use and safety profile***
   Aspirin is a widely available, inexpensive, and well-tolerated drug, particularly at low doses. Its long-established safety profile in cardiovascular and cerebrovascular disease management makes it an attractive option for patients with NAION, particularly those who have concurrent vascular risk factors.

Controversies surrounding aspirin use in NAION

1. ***Lack of robust evidence***
   Despite the potential theoretical benefits, there is a lack of robust clinical trial data to conclusively support aspirin's efficacy in NAION. Randomised controlled trials (RCTs), considered the gold standard for evaluating treatment effectiveness, are notably absent in this area. Most evidence comes from retrospective studies or small observational cohorts, which are subject to biases such as confounding variables and selection bias. For instance, papers by Hayreh [2, 3] found no significant difference in the recurrence rates of NAION between patients who received aspirin and those who did not, casting doubt on aspirin's protective role. The lack of prospective, placebo-controlled trials is a major limitation in establishing a clear treatment guideline for aspirin in NAION.

2. ***Potential risk of haemorrhage***
   Aspirin, particularly in higher doses, carries a well-documented risk of gastrointestinal and intracranial haemorrhage. In patients with NAION, who often have coexisting vascular comorbidities such as hypertension and diabetes, the risk of haemorrhagic complications may outweigh the potential benefits of reducing recurrent ischaemic events. The risk-benefit ratio of aspirin must be carefully considered, especially since haemorrhagic complications could lead to worsening vision or other systemic adverse outcomes.

3. ***The controversial role of alternative therapies***
   The controversy over aspirin use is further complicated by the controversy of alternative treatments for NAION, such as systemic or intravitreal corticosteroids and neuroprotective agents. These therapies aim to target the underlying pathophysiology of ischaemic optic neuropathy more directly, offering potentially more effective treatment options. Aspirin's role may thus be limited to specific patient populations, particularly those with significant cardiovascular risk factors, targeting these rather than

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being a universal treatment strategy for NAION per se.

4. Aspirin's impact on initial visual recovery

Some clinicians argue that aspirin has no significant impact on initial visual recovery in NAION patients, as the primary damage from ischaemia is irreversible by the time aspirin therapy is initiated. While aspirin may reduce the risk of recurrence, it is unclear whether it can improve visual outcomes in the affected eye. A meta-analysis of smaller studies concluded that aspirin had no significant effect on visual acuity improvement in patients with acute NAION.

Discussion

Aspirin remains a topic of considerable debate in the management of NAION. While its low cost, accessibility, and potential to reduce the risk of recurrence make it an appealing option, the lack of definitive clinical evidence leaves its use largely based on clinician preference and patient-specific factors. Additionally, the potential for adverse events, particularly in patients with pre-existing comorbidities, necessitates a cautious approach.

The absence of large, randomised controlled trials remains a critical barrier to establishing clear guidelines for aspirin use in NAION. Future research should focus on prospective studies that assess not only the risk of recurrence but also visual outcomes and the overall safety profile of aspirin in this population. Until then, clinicians must weigh the benefits of aspirin on a case-by-case basis, considering the patient's cardiovascular risk profile and the potential for adverse effects.

Conclusion

Aspirin's role in the management of NAION remains controversial. While there is some weak evidence suggesting that aspirin may reduce the risk of recurrence in the contralateral eye, its impact on initial visual recovery is very uncertain, and the potential risks of haemorrhage cannot be ignored. More rigorous clinical trials are necessary to clarify the benefits and risks of aspirin in this condition. In the meantime, the decision to use aspirin should be individualised, with a careful consideration of the patient's overall health and comorbid conditions.

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